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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Young-sun Chun

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EXAMINER

HUFFMAN, JULIAN D

ART UNIT

PAPER NUMBER

2853

DATE MAILED: 11/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/611,422	CHUN, YOUNG-SUN	
	<b>Examiner</b>	<b>Art Unit</b>	
	Julian D. Huffman	2853	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-10, 12-17 and 20-23 is/are rejected.
- 7) ☒ Claim(s) 5, 11, 18 and 19 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 May 2003 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |                                                                                         |                                                                             |
|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. ____.                                                |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date ____.                                                             | 6) <input type="checkbox"/> Other: ____.                                    |

## DETAILED ACTION

### *Claim Objections*

1. Claims 5 and 14 are objected to because of the following informalities:

In claim 5, line 3, the term "the variable moving speed of the carriage" lacks antecedent basis. The language "a variable moving speed of the carriage" is suggested. Appropriate correction is required.

In claim 14, last line, the limitation "the detected actual error distance of the first and second test marks" lacks antecedent basis.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-4, 6-10, 12-17 and 20-23 are rejected under 35 U.S.C. 102(e) as being anticipated by Ikeda (U.S. 6,607,260 B1).

With regards to claim 1, Ikeda discloses a method of measuring image alignment errors for image formation in an ink-jet image forming apparatus having a carriage, the method comprising:

printing two test marks (Fig. 4, a-F, a-R) separated from each other by a designated error distance on a printing medium on which images are printed (column 14, lines 17-22, the designated/ideal error distance is 0, while the actual error distance is detected and corrected);

sensing the two test marks (column 14, lines 34-55);

measuring instants of time when the two test marks are sensed according to a movement of the carriage (column 14, lines 63-67); and

detecting an actual error distance of the two test marks using the measured instants of time and a moving speed of the carriage (column 15, lines 6-39).

With regards to claims 2 and 3, Ikeda discloses that the printing of the two test marks comprises: printing the two test marks on the printing medium using different image printing methods or different printing directions (first mark is printed in first direction which is a first printing method and second mark is printed in second direction which is a second printing method).

With regards to claim 4, Ikeda discloses that the detecting of the actual error distance comprises:

detecting a time difference between the measured instants of time of the two test marks (C1-C2, column 15, line 26, the number of clock pulses counted, C1, C2 represent the times measured and the difference is calculated); and

multiplying the detected time difference by the moving speed of the carriage to generate the actual error distance ( $c1 - c2 \times tv$ , column 15, line 26).

With regards to claim 6, Ikeda discloses that the detecting of the actual error distance comprises: detecting an image alignment correction value by obtaining a distance difference between the designated error distance and the actual error distance (the distance measured represents a difference between a designated value, 0, or no offset, and an actual value).

With regards to claim 7, Ikeda discloses an apparatus for measuring image alignment errors for image formation in an image forming apparatus having a carriage, the apparatus comprising:

- a test mark print-directing unit (fig. 3, element 15) which directs the carriage to print two test marks separated from each other by a designated error distance on a printing medium on which images are printed;

- a test mark sensing unit (1) which senses the two test marks and outputs a sensed result of the two test marks;

- a reference clock generating unit (7) which generates a reference clock and outputs the generated reference clock;

- a sensed instant of time measuring unit which compares the sensed result of the two test marks with the generated reference clock to measure instants of time when the two test marks are sensed according to a movement of the carriage, and outputs the measured instants of time (counter); and

- an error distance detecting unit which detects an actual error distance of the two test marks using the measured instants of time and a moving speed of the carriage, and outputs the detected actual error distance (13).

With regards to claims 8 and 9, Ikeda discloses that the test mark print-directing unit directs the carriage to print each of the two test marks on the printing medium using different image printing methods or in different printing directions (first mark is printed in first direction which is a first printing method and second mark is printed in second direction which is a second printing method).

With regards to claim 10, Ikeda discloses that the error distance detecting unit detects a time difference between the measured instants of time of the two test marks and multiplies the detected time difference by the moving speed of the carriage to output the detected actual error distance (column 15, line 26).

With regards to claim 12, Ikeda further discloses: an image alignment correction value detecting unit which obtains a distance difference between the designated error distance and the actual error distance, detects an image alignment correction value from the distance difference, and outputs the detected image alignment correction value to compensate for the image alignment errors (13, column 15, lines 6-39).

With regards to claim 13, Ikeda discloses an apparatus for measuring an image alignment error for image formation in an image forming apparatus having a carriage, the apparatus comprising:

a test mark print-directing unit (15) which prints two test marks on a printing medium according to a designated error distance; and

an error distance detecting unit (1) which detects an actual error distance of the first and second test marks to compensate for the image alignment error according to the detected actual error distance and the designated error distance.

With regards to claim 14, Ikeda discloses an apparatus for measuring an image alignment error for image formation in an image forming apparatus having a carriage, the apparatus comprising:

a test mark print-directing unit (15) which directs the carriage to print first and second test marks on a printing medium according to a designated error distance;

a test mark sensing unit (1) which senses the first and second test marks and outputs first and second sensed results of the first and second test marks;

a sensed instant of time measuring unit (7) which measures instants of time when the first and second test marks are sensed, according to the first and second sensed results, and outputs the measured instants of time; and

an error distance detecting unit (13) which detects an actual error distance of the first and second test marks using the measured instants of time to compensate for the image alignment error according to the detected actual error distance of the first and second test marks.

With regards to claim 15, Ikeda discloses a reference clock generating unit (7) which generates a reference clock, wherein the sensed instant of time measuring unit generates the measured instants of time according to the sensed result of the first and second test marks and the generated reference clock.

With regards to claim 16, Ikeda discloses that the carriage moves at a moving speed to print the first and second test marks, and the error distance detecting unit generates the actual error distance of the first and second test marks using the measured instants of time and the moving speed of the carriage (column 15, line 26).

With regards to claim 17, Ikeda discloses that the moving speed of the carriage is constant during printing the first and second test marks, and the error distance detecting unit multiplies a time difference between the measured instants of time by the constant moving speed of the carriage to generate the actual error distance (column 15, line 26).

With regards to claim 20, Ikeda discloses that the carriage moves in a first direction, the printing medium moves in a second direction, and the first and second test marks are printed in one of the first and second directions (fig. 1).

With regards to claim 21, Ikeda discloses that the carriage moves with respect to the printing medium to print an image in another printing direction according to a difference between the actual error distance and the designated error distance (column 15, lines 31-39).

With regards to claim 22, Ikeda discloses a method of measuring an image alignment error for image formation in an image forming apparatus having a carriage, the method comprising:

printing two test marks (Fig. 4, a-F, a-R) on a printing medium according to a designated error distance; and



detecting an actual error distance of the first and second test marks to compensate for the image alignment error according to the detected actual error distance and the designated error distance (column 15, lines 6-39).

With regards to claim 23, Ikeda discloses a method of measuring an image alignment error for image formation in an image forming apparatus having a carriage, the method comprising:

directing the carriage to print first and second test marks (Fig. 4, a-F, a-R) on a printing medium according to a designated error distance;

sensing the first and second test marks to output first and second sensed results of the first and second test marks (column 14, lines 44-46);

measuring instants of time when the first and second test marks are sensed, according to the first and second sensed results to output the measured instants of time (column 14, lines 56-67); and

detecting an actual error distance of the first and second test marks using the measured instants of time to compensate for the image alignment error according to the detected actual error distance of the first and second test marks (column 15, lines 6-39).

***Allowable Subject Matter***

4. Claims 5, 11, 18 and 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

With regards to claims 5, 11, the prior art of record does not disclose integrating the variable moving speed of the carriage, as claimed in the combination.

With regards to claim 18, the prior art of record does not disclose a variable moving speed which is calculated.

With regards to claim 19, the prior art of record does not disclose detecting whether the moving speed is constant or variable, as claimed in the combination.

Though it is generally known in the art that carriage velocity may vary due to mechanical tolerances, nothing in the prior art, or in the explicit teachings of Ikeda, suggests that in the invention of Ikeda, the velocity is variable and requires some sort of correction. Most importantly, the accuracy of the timing correction in Ikeda relies on the assumption that the carriage velocity is constant, otherwise undersirable results are obtained and accurate correction cannot occur. Additionally, the prior art does not teach or suggest detecting a variable velocity during operation of a sensor being scanned by a carriage.

### ***Conclusion***

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julian D. Huffman whose telephone number is (571) 272-2147. The examiner can normally be reached on 9:30a.m.-6:00p.m. Monday-Friday.

Art Unit: 2853

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



JH

5 November 2004



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